

Recommended pick and place tools for LEDs from OSRAM Opto Semiconductors

Application Note



Valid for:
all SMT products

Abstract

OSRAM Opto Semiconductors SMT devices are developed for assembly by automatic placement machines. To achieve a damage-free processing of LEDs, appropriate and individual pick and place tools (the nozzles) must be used.

The following pages provide information about important parameters that should be considered for LED assembly. Furthermore a recommended nozzle design for each LED in the OSRAM Opto Semiconductors portfolio is given.

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A. Pick and place process

As is the standard for SMD devices, all SMD LEDs from OSRAM OS are designed for an automated pick and place process. To receive optimal process results, it is necessary to set the pick and place machine properly.

In the initial production run, it must be ensured that the LED package can be grabbed by the nozzle and sucked out of the tape pocket. Therefore an appropriate nozzle (pipette or pick-up tool) has to be used. This application guide gives an overview of the recommended nozzles and the dimensions. An appropriate nozzle not only ensures a good pick and place process, it also helps to prevent damage to the LED.

To avoid any damage during the pick-up process, the pick-up position should be controlled and adjusted during the set-up. All other pick and place process parameters should also be adjusted. The default settings of the machine are a good starting point. The placement force, for example, can be tested with 2.0 N at the beginning, but it should be less than 2.0 N if possible.

B. Overview of recommended nozzle designs

For the processing of LEDs it must be ensured that the process parameters are conform to the package characteristics during assembly.

If nozzles or nozzle designs other than the recommendations are used, it must be strictly observed that especially the critical and optical relevant area (area over die/s and wire bond/s) is not loaded.

If further information or support regarding the processing of LEDs is needed please contact OSRAM Opto Semiconductors.

A catalog with a linkage of the tools to the associated LED product family is listed in Table 1. This table shows each LED product family and the recommended nozzle design with the nozzle number and a dimension drawing of the nozzle. Alternative nozzles are indicated for some products. Since most products were

tested with SIPLACE pick and place machines, SIPLACE nozzles are often recommended. If other types of pick and place machines are used in the field, please use modified tools according to the given dimensions and body structure for the mounting.

Table 1: Recommended nozzle designs for the OSRAM OS SMT portfolio


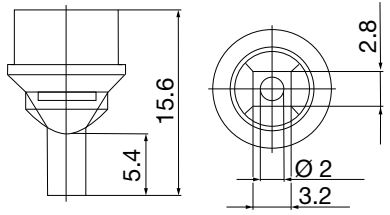

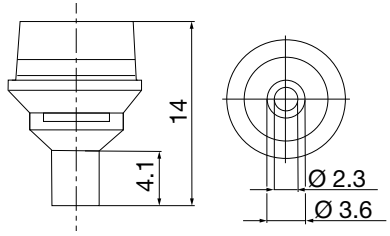

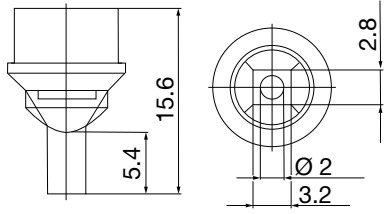

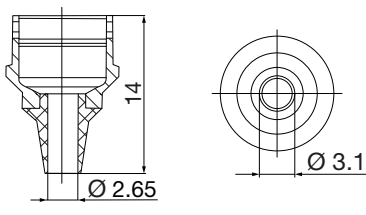

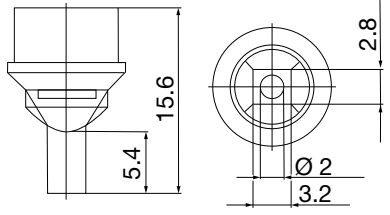
Product family		Recommended nozzle design
Advanced Power TOPLED Lx G6xP		SIPLACE 03055425 
Advanced Power TOPLED Plus Lx G5xP / Lxx G5xP		SIPLACE 03066826 
Power TOPLED Lx E67x SFH 4250 / SFH 4240 / SFH 331 / SFH 7225 / SFH7250 / SFH 7251 / SFH 7252		SIPLACE 03055425 
Power TOPLED Lens Lx E63x SFH 4258 / SFH 4259 / SFH 4248 / SFH 4249		SIPLACE 03054261 
TOPLED Lx T67x / Lx T678x SFH 4053 SFH 4243 SFH 4257		SIPLACE 03055425 

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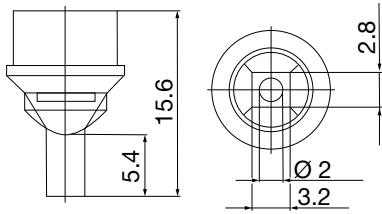

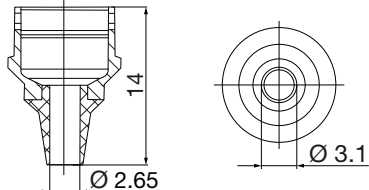

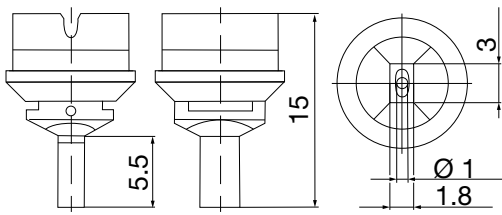

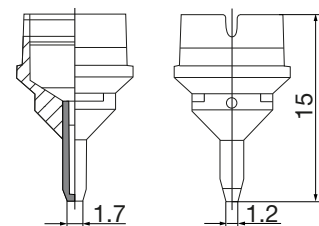

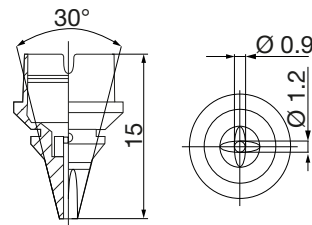

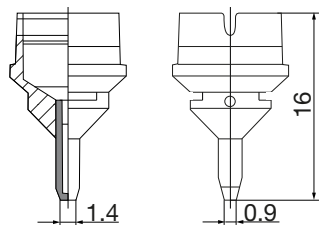
Product family	Recommended nozzle design		
TOPLED Reverse Gullwing Lx T77x SFH 4253 R SFH 4257 R		SIPLACE 03055425 	
TOPLED Lens LG T65X / Lx T6xx		SIPLACE 03054261 	
TOPLED E3014 LUW JLSH KW DCLMS11.PC		SIPLACE 03089731 	
CERAMOS CW CBLPMx.xx		SIPLACE 704 / 904 	
CERAMOS Gen C1 CW VHLPD2.EN		SIPLACE 731 / 931 	
CHIPLED SFH 4053 SFH4043		SIPLACE 701 / 901 	

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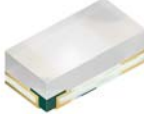
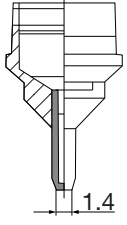
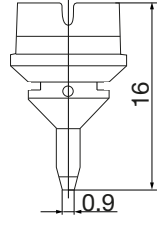

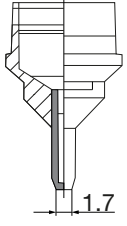
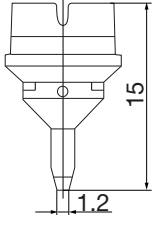

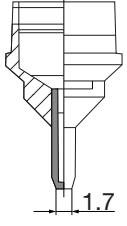
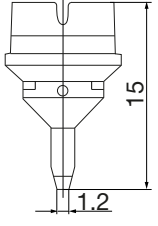
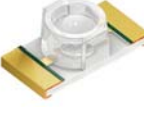
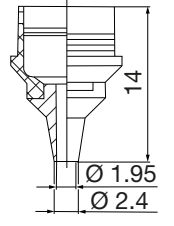

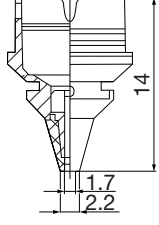
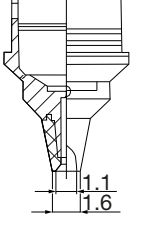

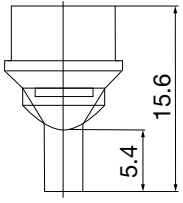
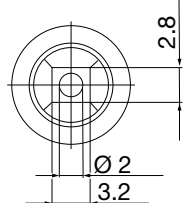
Product family	Recommended nozzle design	
CHIPLED 0402 Lx QHxG		SIPLACE 701 / 901  
CHIPLED 0603 Lx Q3xx Lx Q976		SIPLACE 704 / 904  
CHIPLED 0805 Lx R97x		SIPLACE 704 / 904  
CHIPLED with Lens SFH 4052 SFH 4046 SFH 4056		SIPLACE 328149 
CURAMOS LUW CJSN		SIPLACE 733 / 933  
DISPLIX LRTB GRxG		SIPLACE 03055425  

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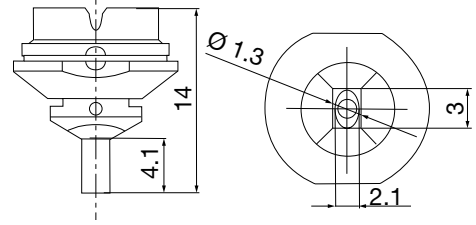
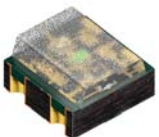
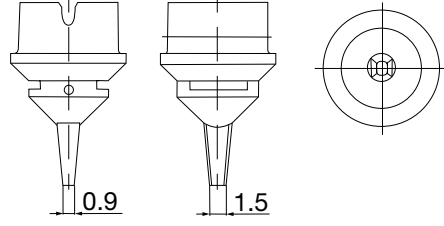

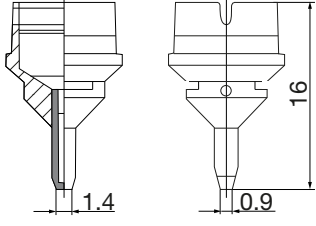

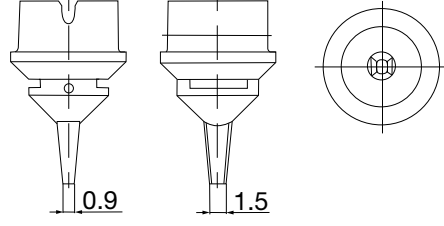

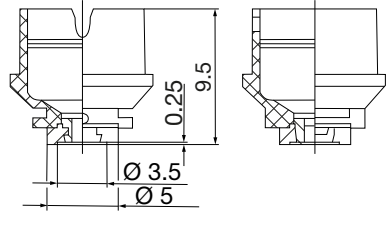

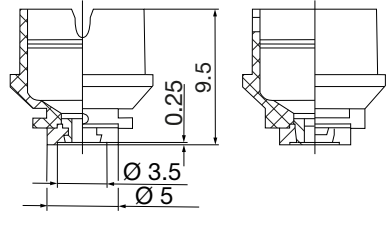
Product family	Recommended nozzle design	
DISPLIX oval Kx HAVPA1.xx		SIPLACE 3110076 
DISPLIX KRTBEILP41.32		SIPLACE 711 / 911 
FIREFLY Lx VHxx		SIPLACE 701 / 901 
FIREFLY E1608 Cx DELSS1.x2		SIPLACE 711 / 911 
Golden DRAGON Lx W5SM		SIPLACE 739 / 939 
Golden DRAGON Plus Lx W5AM LxW W5AM SFH 4232A		SIPLACE 739 / 939 

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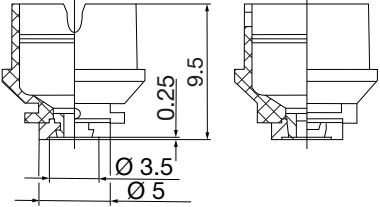

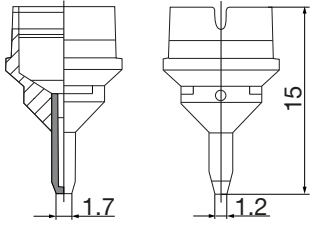

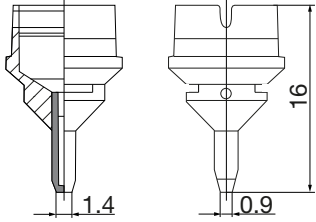

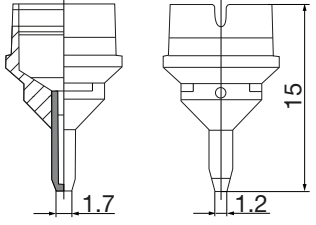

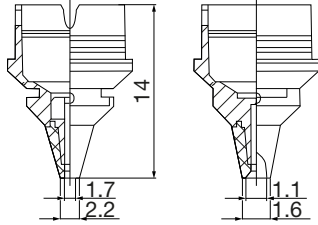
Product family	Recommended nozzle design	
Platinum DRAGON Lx W5SN		SIPLACE 739 / 939 
Micro SIDELED Lx Y87x LW Y1SG KRBTQCLP61 SFH 4254		SIPLACE 704 / 904 
Micro SIDELED 3806 CUW Y3SH.B1		SIPLACE 701 / 901 
Mini TOPLED Lx M67x LCB M67x SFH 4247		SIPLACE 704 / 904 
Mini TOPLED Lx MxSG		SIPLACE 733 / 933 

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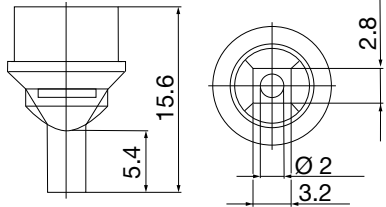
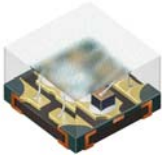
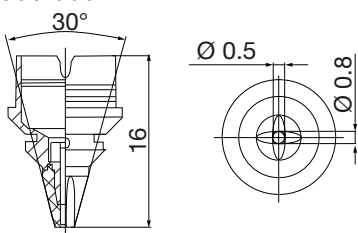

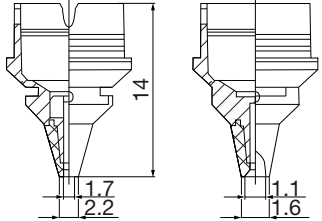

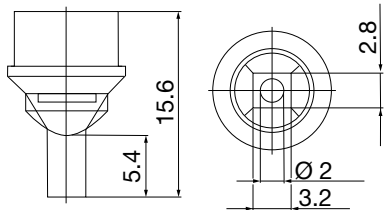
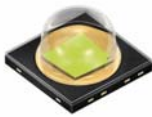
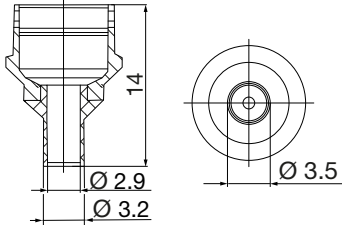
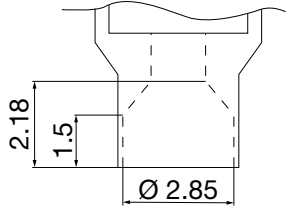
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MULTILED Lxxx Gxxx	SIPLACE 03055425	 
Multi CHIPLED LRTB RxxG	SIPLACE 730 / 930	 
Multi CHIPLED LTRB RxSx	SIPLACE 733 / 933	 
Multi TOPLED Lxx T67x LxG T77x	SIPLACE 03055425-01	 
OSLON Black Lx H9GP SFH 4713 / SFH 4714 SFH 4715 / SFH 4725 SFH 4716 / SFH 4726	SIPLACE 3071799	 
	Essemtec paraquda SP26/BN15	

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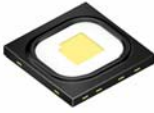
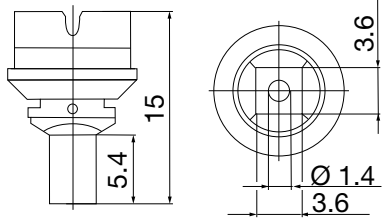

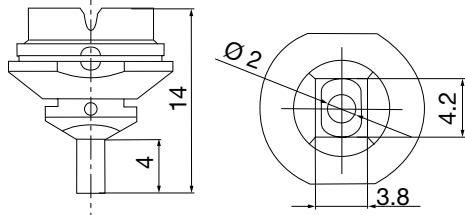

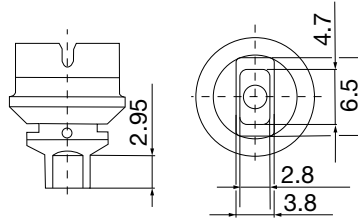

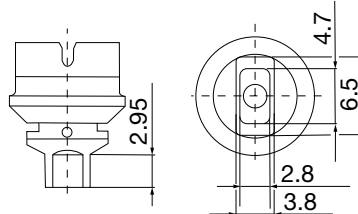

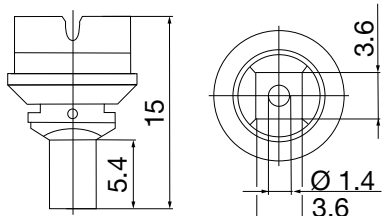
Product family	Recommended nozzle design		
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OSLON Black Flat KW HJL531.TE		SIPLACE 3110067	
OSLON Black Flat KW HKL531.TE		SIPLACE 3098314	
OSLON Black Flat KW HLL531.TE		SIPLACE 3098314	
OSLON Black Flat KW H2L531.TE		SIPLACE 3077709	

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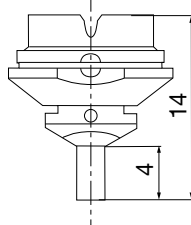
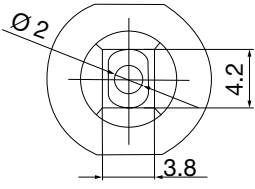
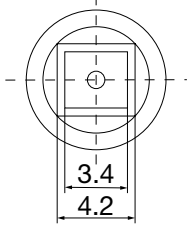

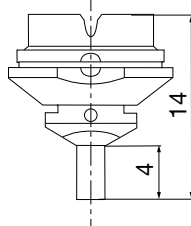
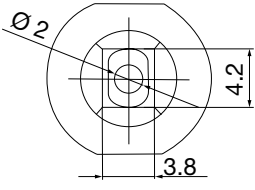

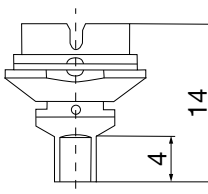
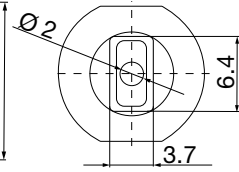
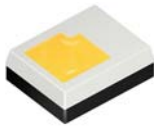
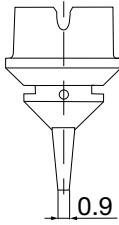
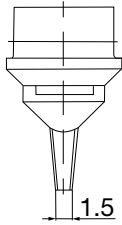

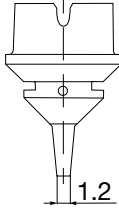
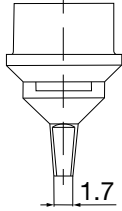
Product family	Recommended nozzle design		
OSLON Black Flat KW H3L531.TE		SIPLACE 3110067 	
		Essemtec paraquda SP26/BN36 	
OSLON Black Flat KW H4L531.TE		SIPLACE 3110067 	
OSLON Black Flat KW H5L531.TE		SIPLACE 3110071 	
OSLON Compact CM LUW CEUN.CE		SIPLACE 711 / 911 	
OSLON Compact CL LCY CEUP LUW CEUP.xx		SIPLACE 714 / 914 	

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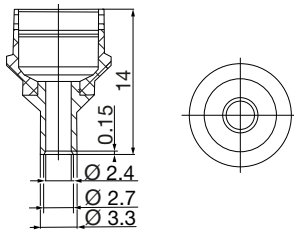
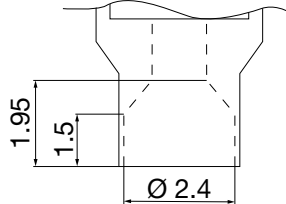

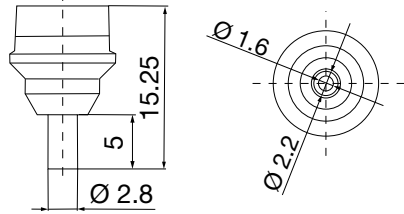

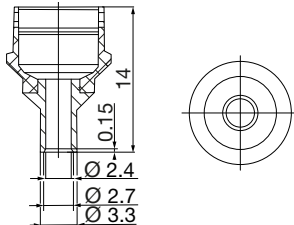
Product family		Recommended nozzle design
OSLON SX / OSLON MX / OSLON LX / OSLON Signal Lx Cxxx / Lxx Cxxx / LxW Cxxx		SIPLACE 03065915-02 
		Essemtec paraquda SP26/BN04 
OSLON Square Flat KW CSLPM2.PC		SIPLACE 03112073 
OSLON Square GW CSSRM1.xx LCW CQAR.xx		SIPLACE 03065915-02 

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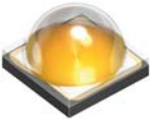
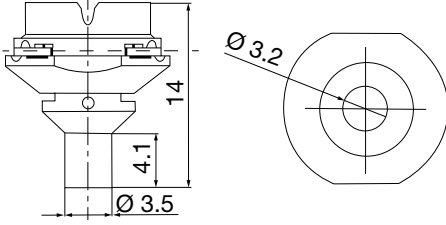
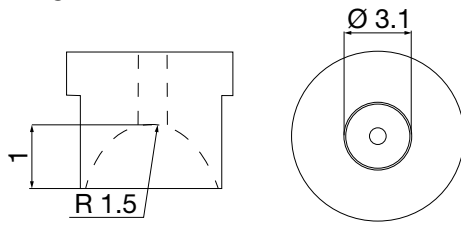

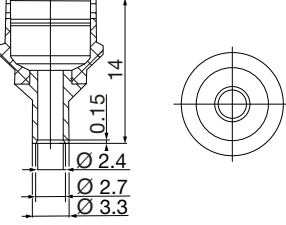

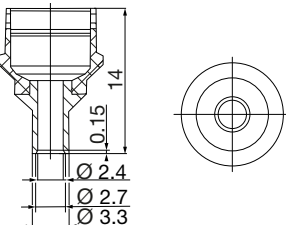
Product family	Recommended nozzle design	
OSLON Square GW CSSRM2.xx		<p>SIPLACE 03090409</p>  <p>ChingYi: P/N: JUK-0381/15</p>  <p>Alternative nozzle: SIPLACE 03122708-03 Alternative nozzle dimensions: Outer dimension: Ø 3.5mm Inner dimension: Ø 1.7mm</p>
OSLON SSL 80 White / Colors GW CS8PM1.xM LCW CR7P.xC Cx CS8pMx.xx Lx Cx7P		<p>SIPLACE 03065915-02</p> 
OSLON SSL 150 White / Colors GW CSHOM1.xM LCW CRDP.xC Gx CSHPMx.xx Lx CxDP		<p>SIPLACE 03065915-02</p> 

Table 1: Recommended nozzle designs for the OSRAM OS SMT portfolio

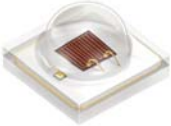
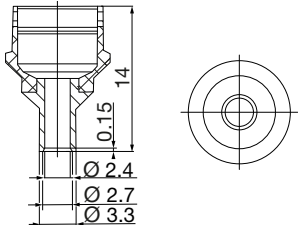
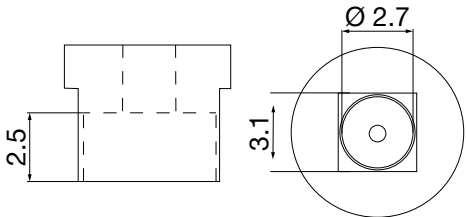

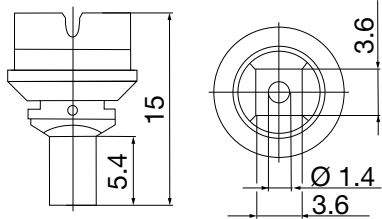

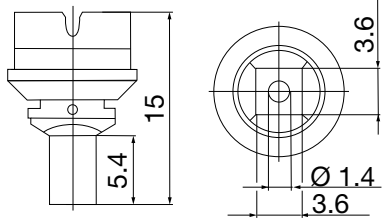

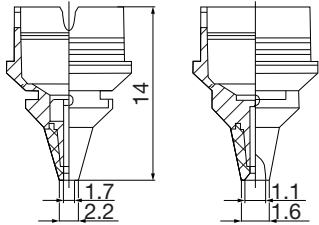

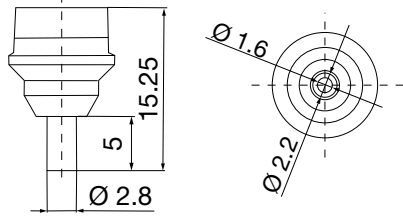
Product family	Recommended nozzle design	
OSLON SSL 120 Gx CSSPM1.xx		SIPLACE 03065915-02  ChingYi: P/N: JUK-0778/16 
OSLUX LUW F8xN		SIPLACE 3077709 
OSLUX SFH 4780S SFH 4786S SFH 4796S SFH 4787S		SIPLACE 3077709 
OSRAM OSTAR Headlamp SMT LE UW Q9WP		SIPLACE 733 / 933 
OSRAM OSTAR Projection Compact KW CSLNM1.TG		SIPLACE 03112073 

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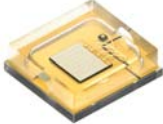
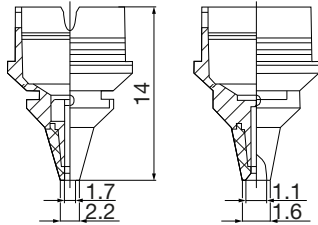
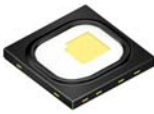
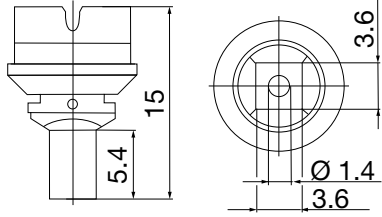
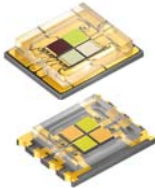
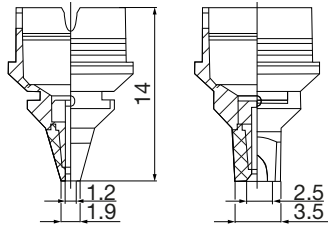
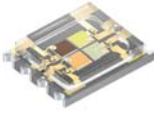
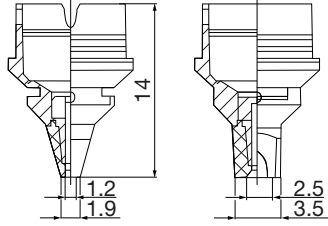

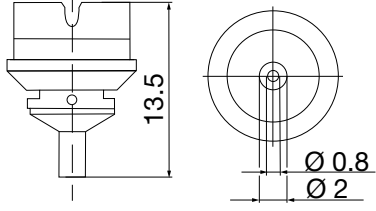

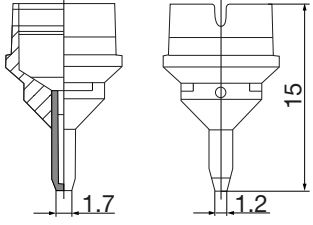
Product family		Recommended nozzle design
OSRAM OSTAR Projection Compact LE x Q9Wx LE BA Q6WM LCR H9RN LE x Q8WP LE x Q7WP		SIPLACE 733 / 933 
OSRAM OSTAR Projection Cube LCG H9Rx		SIPLACE 3077709 
OSRAM OSTAR Stage LE RTDUW S2Wx LE x Q8WP		SIPLACE 735 / 935 
OSRAM OSTAR Medical LE xxxx S2W		SIPLACE 735 / 935 
PointLED Lx P4xx		SIPLACE 3010529-01 
Power SIDELED Lx B6SP		SIPLACE 704 / 904 

Table 1: Recommended nozzle designs for the OSRAM OS SMT portfolio


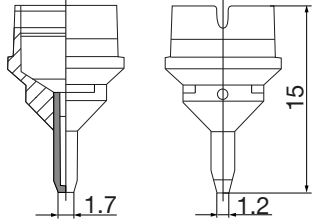

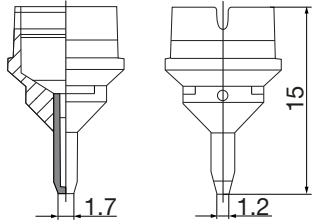

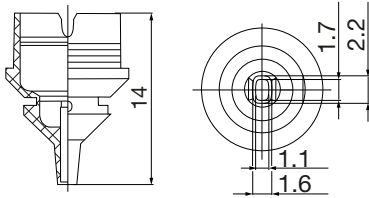

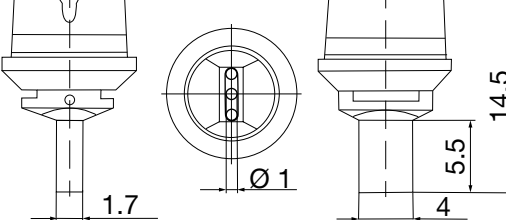

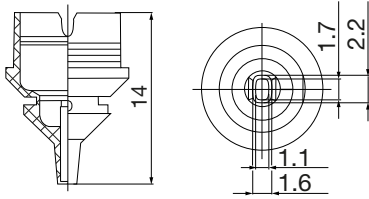
Product family	Recommended nozzle design	
SIDELED Lx A67x SFH 4256 SFH 4244 SFH 4255		SIPLACE 704 / 904 
SMARTLED 0603 Lx L2xx SFH 4050		SIPLACE 704 / 904 
SYNOS P2720 Kx DMLx31 SFH 4770S		SIPLACE 713 / 913 
SYNOS E4014 KW DPLS3x		SIPLACE 03024486 
DURIS E 2 GW JBLMSxEM		SIPLACE 713 / 913 
Alternative nozzle: ChingYi: P/N: JUK-0344/17		

Table 1: Recommended nozzle designs for the OSRAM OS SMT portfolio


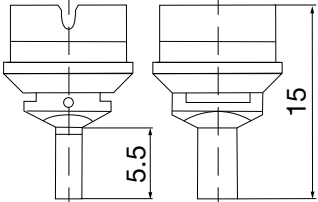
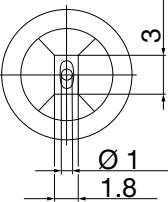

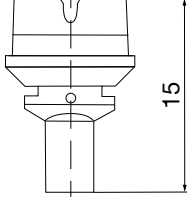
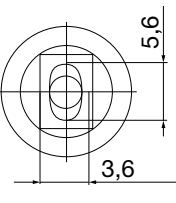

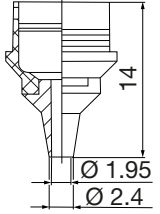

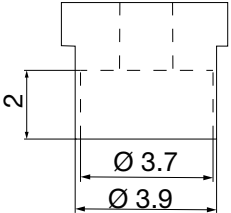
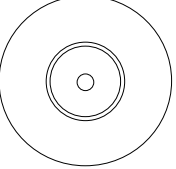
Product family	Recommended nozzle design		
DURIS E 3 GW JCLPSx.Ex LUW JNSH.xC		SIPLACE 03089731  	Alternative nozzle: ChingYi: P/N: JUK-0436/15
DURIS E 5 GW JDSxS1.xC GW JDSxSx.EM		SIPLACE 03085563  	Alternative nozzle: ChingYi: P/N: JUK-0436/15
DURIS P 5 GWDASPA1.EC Gx DASPA1.xx		SIPLACE 0328149 	
DURIS P 8 GW PUSRA1.PM		ChingYi: P/N: JUK-0461/15  	

Table 1: Recommended nozzle designs for the OSRAM OS SMT portfolio


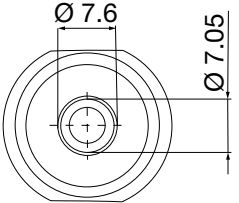
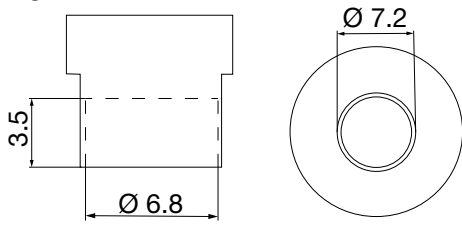
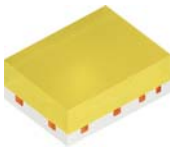
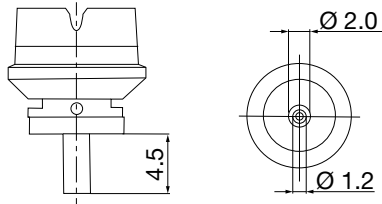
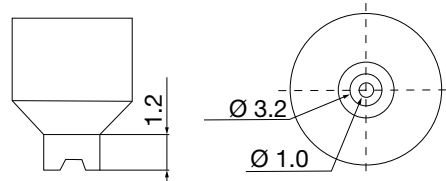

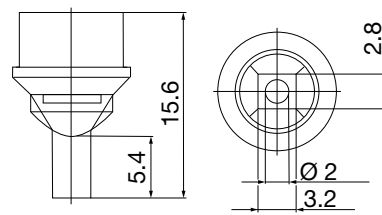
Product family	Recommended nozzle design	
DURIS P 10 GW P7STAx.PM	 	SIPLACE 3138682
		ChingYi: P/N: JUK-0695/13
DURIS S 2 GW SBLMAx.EM	 	SIPLACE 3117100
		JUKI "KE-2080RL"; Nozzle 503
	Alternative nozzles: Essemtec paraquda SP26/BN39 Ching Yi Nozzle JUK-0049/15 Ching Yi Nozzle 104590801403 (D)	
DURIS S 5 Gx PSLx31.xx GW PSLPS1.xC GW PSLRS1.xC	 	SIPLACE 03055425
	Alternative nozzle dimensions: Outer dimension: Ø 3.0mm Inner dimension: Ø 1.5mm	

Table 1: Recommended nozzle designs for the OSRAM OS SMT portfolio


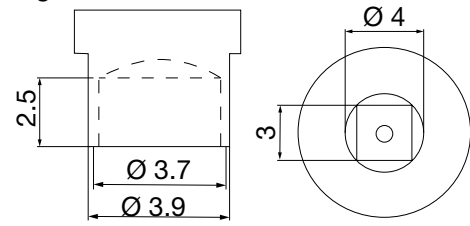
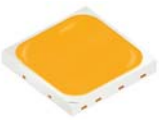
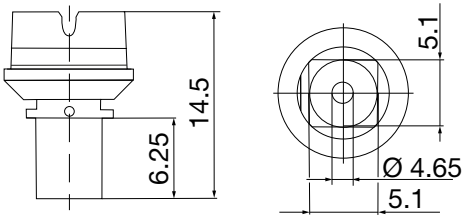

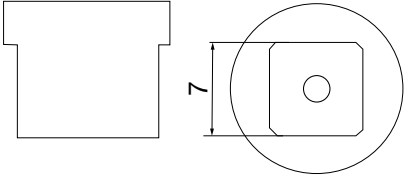

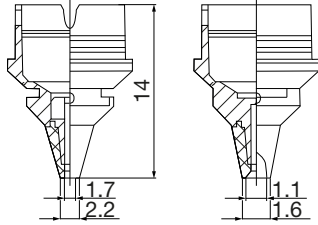
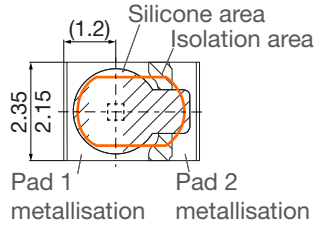

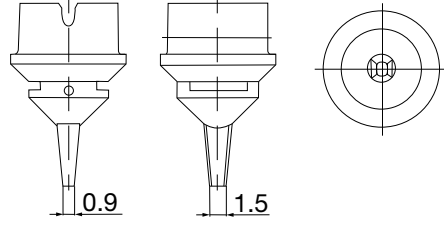

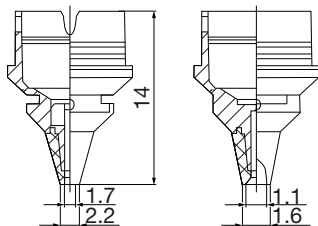
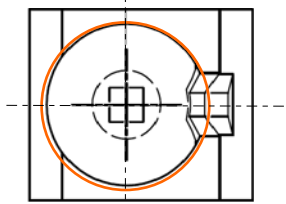

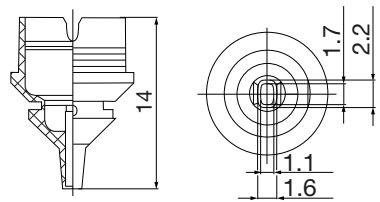
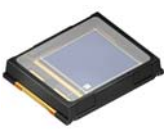
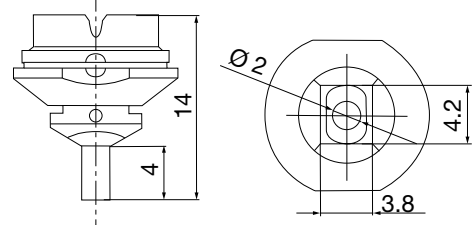
Product family	Recommended nozzle design	
DURIS S 5E GW JSLPS1.EM	ChingYi: P/N: JUK-0130/17	 
DURIS S 8 GW P9Lx3x.xM	SIPLACE 3083400	  <p>Alternative nozzle dimensions: Outer dimension: Ø 5,0mm Inner dimension: Ø 3,2mm</p>
DURIS S 10 GW P7LP32.xM	ChingYi: P/N JUK-0342/17	 
MIDLED Toplooker SFH 4651 SFH 4641 SFH 4650 SFH 4640	SIPLACE 733 / 933	  <p>Recommended Nozzle-Design</p> 

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Product family	Recommended nozzle design		
MIDLED Sidelooker SFH 4656 SFH 4646 SFH 4655 SFH 4645 SFH 4647		SIPLACE 711 / 911	
Mini MIDLED SFH 4451 SFH 4441		SIPLACE 733 / 933	 <p>Recommended Nozzle-Design</p>  <p>min. inner diameter: Ø 1.7mm</p>
T-MIDLED Sidelooker SFH 4140		SIPLACE 713 / 913	
IR TOPLED D5140 SFH 2200 SFH 2240		SIPLACE 3110067	



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